Remarks

The Examiner rejected the independent claims for obviousness over Achilleoudis in view of Czerwiec and Lamport, and for some claims in view of Deng also. In the amendments above, this rejection is addressed by adding the feature of a point to point subscriber line carrying a digital subscriber line service, (e.g. xDSL, and exemplified in the description by ADSL or VDSL). The management systems at either end are arranged to control and supervise this link by means of messages passed over the EOC in the form of asynchronous minicells.

There is basis in the original application for a point to point link since the background section refers to a twisted pair subscriber loop or link to an exchange and to VDSL and ADSL which are inherently suited for point to point subscriber lines. Also, the objects of the invention refer to a subscriber link between a VDSL customer and an exchange, as does fig 2. The description of fig 2 refers to the exchange having a line termination equipment for each VDSL subscriber, which can only mean each line is point to point.

Consequences of this distinctive feature

The use of minicells for link management messages is unusual because point to point link level EOC messages are usually passed down protocol levels for transmission, not upwards to higher protocol layers. This means, as mentioned at the bottom of page 2 of the application as filed, that:
"currently employed EOC arrangements suffer from the disadvantage that they are protocol specific and thus lack flexibility".

According to the invention, by transmitting such subscriber line link control messages as minicells, the EOC messages can be regarded as being passed to a higher level protocol instead. The benefit resulting from the claim is stated at the bottom of page 5 of the application as filed as follows:
"by carrying the EOC channel in minicells, this channel is rendered wholly independent of the protocol or protocols employed for VDSL transport."

This independence is important because VDSL and similar transport protocols for point to point links can be installed and upgraded for each subscriber separately. Hence it is vital for the carrier organisation to be able to manage many different varieties of such protocols efficiently. This can be achieved if the link management messages at least are independent of the varieties of the link protocol in use by different subscribers.

Why it is not suggested by Achilleoudis

There is no suggestion of this unusual solution, nor of its advantages, in Achilleoudis. Achilleoudis is not concerned with the management of such a point to point subscriber link at all, and certainly not with sending control and supervision messages for a digital subscriber line type point to point link (such as a VDSL link). The closest Achilleoudis comes to this is the mention of minicells being allocated for housekeeping, ranging, and MAC layer (Media Access Control) which provides an abstract service layer that allows network layer protocols to be indifferent to the underlying details of how network transmission and reception operate. But the housekeeping is not related to a subscriber link over a point to point subscriber line. It relates to a broadcast network as shown in fig 1, which includes a head end and many subscriber ends, coupled by a network. As stated at lines 61 to 63 of col 3 of Achilleoudis, this network is "a hybrid fiber coax network (tree and branch network) where the loop length and attenuation differ per subscriber, both time ranging and power ranging and some kind of medium access protocol have to be implemented...".

This is obviously different from a point to point subscriber line because in a tree and branch network, the signals to different subscribers must share a common path at some point, and so can interfere with each other. Hence all subscribers must use the same or compatible equipment to couple to the network. Hence there is no need to be able to manage many different or incompatible protocols efficiently in such a network. Hence the advantage of such efficiency by using minicells for point to point link management messages does not appear in Achilleoudis where minicells are used only for network management messages. For this reason, a skilled person has no incentive, without hindsight, to apply minicells to the different problem of managing point to point links efficiently.

None of the other cited references show or suggests this distinctive feature nor its advantages. For these reasons claim 1 cannot be obvious over Achilleoudis taken alone or in combination with any other cited reference.

Czerwiec and Lamport are cited in respect of features now removed from claim 1, and so these references are no longer relevant. Deng is cited as showing an ADSL modem, but as it does not show using minicells for point to point link management, it is also not relevant to claim 1.

The features removed from claim 1

The features added to claim 1 in the response of 17 October 2002 have now been removed. These features were added in response to the Examiner's indication that claim 11 was allowable, which has since been withdrawn by the Examiner. In view of this withdrawal, the reasons for including these features has disappeared and it is respectfully requested that the removal of these features be allowed, especially as claim 1 is clearly novel and nonobvious without these features, as explained above. Correspondingly, the dependent claims 3 and 8-11 which were deleted without prejudice for the same reasons, are also reinstated.

Concluding remarks

The other claims all have the same or similar features or are dependent on claim 1, and so are allowable for the same reasons. The amendments all address the rejections directly, and so no new issues are raised. Accordingly, favorable reconsideration is requested.

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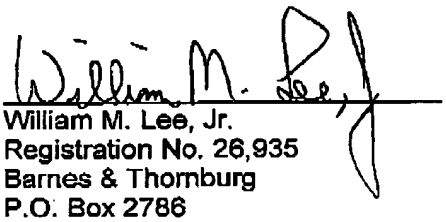
Respectfully submitted,



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